Knowledge and attitude of pregnant woman toward umbilical-cord-blood collection

Tingkat pengetahuan dan sikap ibu hamil terhadap penyimpanan darah tali pusat

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Abstract

Objective: Stem cell technology from umbilical cord blood (UCB) has developed fast as health services. UCB could be used in many kinds of disease. Private UCB bank has been operated in many places all over Indonesia. There's a need for research to evaluate the knowledge and attitude of pregnant woman towards the act of collecting UCB.

Method: This is a cross-sectional study base on question-naire given to 163 pregnant women in three private hospitals in the Bandung City from September - November 2009. The result was analyzed with Rank-spearman correlation and Kruskal-Wallis chi-square.

Result: Most respondent were 20 - 29 years old pregnant women (54.6%), with educational level of strata-1 (S-1) (41.1%), with monthly income within 5 - 10 million rupiah (35.6%). This is the second pregnancy or more (42.9%), with gestational age less than 24 weeks (61.3%) and variative obstetric history (59.5%). The average level of knowledge was poor and attitude scale was uncertain (3.4). There is a significant correlation between age (p = 0.008%; CI 95%), level of education (p = 0.0001; CI 95%) and knowledge. There is a significant correlation between gestational age and attitude (p = 0.003; CI 95%). Respondent's level of knowledge also has a significant correlation with attitude (τ_s = 0.421; p = 0.0001; CI 95%).

Conclusion: This study described the respondent's poor knowledge will influence their attitudes toward UCB collection, so it is necessary for disseminating more information on UCB as an effort to get better research result on UCB.

[Indones J Obstet Gynecol 2010; 34-2: 97-100]

Keywords: knowledge level, attitudes, collecting UCB, pregnant woman, the Bandung city

Abstrak

***Tujuan**: Tujuan: Teknologi sel punca yang berasal dari darah tali pusat (DTP) saat ini berkembang dengan pesat untuk pelayanan kesehatan. DTP ini dapat dipergunakan pada berbagai macam penyakit. Beberapa cabang bank DTP swasta telah beroperasi di Indonesia. Sehingga perlu dilakukan penelitian tingkat pengetahuan dan sikap ibu hamil terhadap pengumpulan DTP.*

***Metode**: Dilakukan penelitian survey cross-sectional pada 163 orang ibu hamil di tiga rumah sakit swasta Kotamadya Bandung sejak September - November 2009. Kuisioner berupa kuesioner tertutup. Hasil yang di dapat dianalisis dengan menggunakan uji korelasi Rank-Spearman dan uji chi-kuadrat Kruskal-Wallis.*

***Hasil**: Karakteristik terbesar responden berusia 20 - 29 tahun (54,6%), berpendidikan S-1 (41,1%), pendapatan perbulan 5 sampai 10 juta rupiah (35,6%). Kehamilan saat ini adalah kehamilan yang ke-2 atau lebih (42,9%), usia kehamilan kurang dari 24 minggu (61,3%) dan riwayat obstetri yang bervariasi (59,5%). Rerata tingkat pengetahuan kurang (50,97%) dan skala sikap ragu-ragu (3,4). Didapatkan hubungan bermakna antara usia (p = 0,008%; CI 95%) dan tingkat pendidikan terhadap tingkat pengetahuan (p = 0,0001; CI 95%). Terdapat hubungan bermakna antara usia gestasi dengan sikap responden (p = 0,003; CI 95%). Tingkat pengetahuan responden juga bermakna secara statistik terhadap sikap responden (τ_s = 0,42; p = 0,000; CI 95%).*

***Kesimpulan**: Penelitian ini menggambarkan tingkat pengetahuan responden yang rendah akan mempengaruhi sikap terhadap pengumpulan DTP, sehingga dibutuhkan penyebaran informasi yang lebih baik lagi mengingat manfaat yang didapat melalui penelitian DTP.*

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***Kata kunci**: tingkat pengetahuan, sikap, pengumpulan darah tali pusat, ibu hamil, Kotamadya Bandung*

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INTRODUCTION

At the end of twentieth century, stem cell has attracted scientists and medical practitioners due to its distinguished potentials. Since then, it has become the prominent hope to be primarily used for degenerative diseases. Research on the use of stem cells for clinical application has been one of the most emerging medical sciences that being discussed.[1] A more thorough understanding on stem cell's characteristics has enabled scientists to make breakthrough in medicine. One of the most obvious results that has been applied in clinical practice is hematopoietic stem cell transplantation to reconstitute hematopoietic and immunological function after high dose chemotherapy.[2]

Stem cell is the only type of cell that could execute self renewal activity in order to mantain the number in its niche. Stem cell has also been known to have an excessive proliferative capacity, and the potential to differentiate into multilineages somatic cells. Generally, there are two distinguished type of stem cell: 1) embryonic stem cell, and 2) adult stem cell. Embryonic stem cell is the inner cell mass that could be isolated out of blastocyst. Meanwhile, adult stem cell is type of stem cell that exists in adult tissues, hence it surrounded by fully functional somatic cells. Some adult tissues that are known to contain adult stem cell populations are bone marrow, peripheral blood and umbilical cord blood.[3,4] Eventhough embryonic stem cell possess bigger differentiation and proliferative capacity, its use in research and clinical application has been obstacled by the ethical issue of using embryo as its source.[5,6] Therefore, scientists and practitioners in many countries prefered to use adult stem

cell than embryonic stem cell. Unfortunately, the quantity of adult stem cell consist in adult tissues are very few. Broxmeyer et al. experimentally found that umbilical cord blood contains high number of adult stem cells.[7]

One type of adult stem cells that mainly contained within the umbilical cord blood is hematopoietic stem cells.[8,9] Based on this knowledge, umbilical cord blood is no longer seen as a medical waste, but appreciated as a source of hematopoietic stem cells that could replace the role of bone marrow in cell replacement therapy. Moreover, in some European countries, umbilical cord blood has been expertly collected and preserved in cord blood banks owned by the government or private.[1]

Considering its potential use in the later time of life, especially when medical technology has perfected the use of stem cell in cell replacement therapy, every country in the world, including Indonesia, should considered of the need to build cord blood bank. In order to optimize the delivery of information about the necessity to preserve umbilical cord blood, this research was performed to assess the knowledge of pregnant women on the research and collection of umbilical cord blood.

METHODS

The methods of this research was cross-sectional survey on 163 pregnant women who were doing prenatal examinations at three private hospitals in Bandung for the period of September - November 2009. Provided answers for every question in the questionnaire were correct and false. The questions were mainly focused on the definition, usage and source of stem cells. Questions about related ethical problem were also asked. The answers were graded using scale attitude 1 - 5 from unagree to totally agree.

Questionnaire enclosed questions stated above was given in a closed envelope to every pregnant woman who did their prenatal examination. Out of 200 given questionnaires, there were 163 questionnaires that were resturned and analyzed by using SPSS version 16.0, based on Rank-Spearman correlation study and Kruskal-Wallis chi-square.

RESULTS

There were 163 questionnaires that returned and analyzed in this study. Out of those questionnaires, the largest demographic proportion of respondents was identified in the group of people in young reproductive age between 20 - 29 year old (54.6%), with educational status as bachelor or S-1 (41.1%) and monthly salary range 5 - 10 millions rupiah (35.6%).

The present pregnancy of most respondents were not the first nor the second (42.9%), at the gestional age of less than 24 weeks (61.3%) and had various obstetrics history (59.5%).

Characteristics of the resulted data placed most respondents in the group of middle to higher economics level, with relatively high educational background and salary, at the gestational age range from first to second trimester, with various obstetrics history (Tabel 1).

Table 1. Characteristics of Research Subject

Characteristics	Quantity	Percentage (%)	Notes
Age (in year)			
20 - 29	89	54.6	$\bar{X}$ (SD) = 29.35 (5) range: 22 - 40
30 - 39	70	42.9	
> 40	4	2.5	
Educational background			
Highschool	10	6.1	
Diploma 3	25	15.3	
S-1	67	41.1	
S-2	46	28.2	
S-3	15	9.2	
Salary (in rupiah)			
< 5 millions	54	33.1	
5 - 10 millions	58	35.6	
10 - 15 millions	22	13.5	
15 - 20 millions	22	13.5	
> 20 millions	7	4.3	
Parity			
0	55	33.7	
1	38	23.3	
> 1	70	42.9	
Gestational age			
< 24 weeks	100	61.3	
24 - 35 weeks	34	20.9	
> 35 weeks	29	17.8	
Obstetrics history			
Abortion	39	23.9	
Other medical history	27	16.6	
Other obstetrics history	97	59.5	

Mean of the correct answers for twenty given questions was 50.97%, hence it can be tabulated that the respondents' knowledge were still insufficient. Out of the total 163 respondents, there were 99 (60.74%) respondents who were classified as respondents with insufficient knowledge, while there were only 3 respondents (1.84%) classifficated as respondents with sufficient knowledge.

The highest correct answer was about "Preserved umbilical cord blood can be used for every one that needed" (73%) and the lowest correct answer was about "the use of umbilical cord blood will not cause any harmful infection" (37.4%), as shown in Tabel 2.

There were 100 respondents (61.3%) regard that cells obtained from umbilical cord blood is now being used for the purpose of human cloning. In general, the attitude of respondents on the collection and research of umbilical cord blood is at the scale of 3,4 (out of 100), which can be concluded that it was placed at the scale of hesitation.

Most probably, this was due to the lack of respondents' knowledge (Table 3). Most of the respondents thought that they have insufficient knowledge (41.10%), hence they hope to get the information directly from the doctor that taking care of them (53.37%) and given since their first trimester of pregnancy (34.36%).

Respondents also hope that if there is any disagreement between parents about the later usage of umbili-

cal cord blood, the final decision made by the mother of the related child (41.10%). Most respondents did not agree if the umbilical cord blood will be analyzed for any genetic and infectious diseases (46.01%), and its later usage should be permitted first by the parents (53.37%).

Meanwhile, most respondents were also agree that the preserved umbilical cord blood could be used in research for the progress of medical science (46.01%). In correlation with ethical issue and religious value, most respondents showed hesitation to answer whether umbilical cord blood collection and research is truly allowed or not (38.65%).

Different conclusion was collected on the respondents' attitude when they were asked about the necessity of law that regulates the umbilical cord blood collection and research. Most of the respondents were agree that such law and regulation is needed to be made prior to the construction of umbilical cord blood bank (37.42%). Most of them were also mentioned that the center of umbilical cord blood collection should be open in Indonesia (47.85%).

The statistical analysis that was based on Kruskal-Wallis chi-square concluded that there was significant correlation between respondents' age (p = 0.008; CI 95%) and educational background (p = 0.0001; CI 95%) with respondents' knowledge.

Table 2. The Correct Answers on Questions About the Knowledge of Isolation and Research of Umbilical Cord Blood

Knowledge	Quantity	Percentage (%)
Stem cell is a type of cell that is not yet differentiated.	92	56.4
Stem cell could self renew itself.	96	58.9
Division on stem cell type is based on differentiation potential and its source.	78	47.9
Stem cell could be isolated from embrio and umbilical crod blood.	76	46.6
Adult stem cells that were isolated from umbilical cord blood has better differentiation potential than embryonic stem cells.	73	44.8
The disadvantages on the usage of umbilical cord blood stem cells is the risk to get certain genetic and infectious disease.	98	60.1
Umbilical cord blood stem cells could be cloned and create a human.	63	38.7
Stem cell could be used to replace the need of insulin on patients suffer diabetes mellitus.	115	70.6
Stem cell could also be used to rejuvenate skin tissue.	106	65
Parkinson disease can be treated by using umbilical cord blood stem cells.	75	46
Stem cells from umbilical cord blood could regenerate the infarcted are in patients suffer of stroke and myocardial infarction.	82	50.3
In the beginning, stem cell was used to regenerate immunological function in cancer patients.	80	49.1
Religions in the world had agreed on the use of umbilical cord blood stem cells for therapeutic use.	79	42.3
Umbilical cord blood that were taken will further analyzed for any genetic alteration and probabilty of infection. The test results will be informed to the parents.	81	49.7
A number of newborn babies need bone marrow transplantation before their 10th birthday.	76	46.4
Preserved umbilical cord blood can be used for every one that needed.	119	73
12 months after its collection, preserved umbilical cord blood will be re-examined.	69	42.3
Due to its preliminary test, the use of umbilical cord blood will not cause any harmful infection.	61	37.4
Allogenic transplantation of umbilical cord blood cause less rejection on its recipients.	71	43.6
After taking umbilical cord blood, the sample directly preserved in deep freezer at 0°C.	76	46.6

It simply can be concluded that younger respondents has better knowledge. Respondents with higher educational background were also showed to have better knowledge. Respondents' knowledge was not affected by the amount of salary, parity, gestational age, and previous medical history.

Respondents' attitude score was shown to be related significantly only to the gestational age. (p = 0.003; CI 95%). Other respondents' characteristics were not affected the attitude scale statistically.

Tabel 3. The Answers on Questions About the Knowledge of Preganant Women on the Research and Collection of Umbilical Cord Blood

Attitude	Score					$\bar{X}$ Scale (out of 5)
	1	2	3	4	5	
My knowledge about umbilical cord blood bank and the process of umbilcal cord blood preservation is still insufficient.	2	26	34	34	67	3.85
Information about the necessity of the existance and service provided by umbilical cord blood bank should be informed directly by the treating doctor.	11	23	15	27	87	3.96
Information about umbilical cord blood bank should be given since the first trimester of pregnancy.	20	48	4	56	45	3.54
If there is any disagreement between parents, the final decission about the usage of umbilical cord blood comes from the father.	32	67	36	20	8	2.42
The preserved ubilical cord blood should not be tested for any genetic abnormality or prevalence of infection.	75	14	28	15	31	2.47
The privilege to decide the action that would be taken on the preserved umbilical cord blood is belong to the parents.	8	14	9	35	87	3.98
Umbilical cord blood collection is forbiden and against the law of religion.	20	45	63	15	20	2.82
If permitted by the parents, the preserved umbilical cord blood could be used for research.	7	12	36	33	75	3.96

The government should make a law that regulates the collection and usage of umbilical cord blood.	21	33	1	47	61	3.58
Indonesia should have their own umbilical cord blood bank.	18	37	30	0	78	3.51

In general, we found out that educational background affected the knowledge level of respondents very strongly (τ_S = 0.421; p = 0.0001; CI 95%).

DISCUSSION

This research underlined the necessity for extensive dissemination of information about the need on collection and research of umbilical cord blood, particularly for the people in their gestational period.

Stem cell's technology in medicine is relatively new and could potentially cause cultural shock of the society, particularly among the people who has a middle to lower educational background. It could cause a polemic regarding the collection and research of umbilical cord blood from law-, society- and religion-point of view.[10,11]

Result from similar study that was done by Fernandez et al,[12] at Halifax, Nova Scotia, Kanada showed that 307 out of 433 respondents (70%) thought that their knowledge is still insufficient. This answer comes in line with the attitude scale showed that most of them hesitated and more likely to agree on all of the questions written in the questionnaire (attitude scale 3,4). Basically, respondents' attitude was based on their knowledge level.[13]

Respondents were also showed that their knowledge about their rights of the preserved umbilical cord blood is still insufficient. Most of the respondents involved in this research hope that parents' permission must be given prior to the usage of the preserved umbilical cord blood. Armson[13] underlined potential donors should be informed that they do not have they owned-rights for their donated umbilical cord blood, therefore even the family is not guaranteed to be able to get their donated umbilical cord blood when they needed.

Restlessness about the ethical issue and religious value could be concluded as a lack of information about umbilical cord blood usage that previously given to the respondents. Special attention should be given on this fact, especially in case stem cell's technology going to be developed in Indonesia.

Primarily, the world's umbilical cord banks were operated in 1990, at New York, Milan and Dusseldorf. Under the assessment of Dr Pablo Rubinstein, the umbilical cord blood bank of New York made protocols to collect, process and preserve umbilical cord blood. Up to date, the use of umbilical cord blood is being continously studied. We predict that various research will be perform in the next 5 - 10 years in order to reach the perfection of stem cell's technology.[14-16] Therefore, in case Indonesian researchers and clinical practitioners attempted to do deeper-study on this field, the law that regulates its collection and usage should be made first. Restlessness in the society appeared because the lack of knowledge, hence government and doctors should never give-up to disseminate the reliable information regarding the collection and usage of umbilical cord blood.

Limitation of this research is that most respondents are people with middle to higher economics level. Therefore, the conclusion of this research cannot be used as a definite description that represent the whole number of pregnant women in the society.

CONCLUSION AND SUGGESTION

Our study described that respondents' poor knowledge will influences their attitudes toward umbilical cord blood collection and for research. Therefore, it is an absolute need to disseminate the reliable information regarding the necessity of umbilical cord blood collection and research.

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